Universität Basel

Research Project

Lnc-ing cancer drugs to cardiotoxicity: Contribution of lncRNAs to tyrosine kinase inhibitor-related cardiac side effects

Third-party funded project

Project title Lnc-ing cancer drugs to cardiotoxicity: Contribution of lncRNAs to tyrosine kinase inhibitor-related cardiac side effects
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Cancer survivors experience an increased burden of cardiovascular disease. This is in part due to cardiovascular side effects and toxicity of cancer therapies including tyrosine kinase inhibitors (TKIs), but the molecular mechanisms of cardiotoxicity are still incompletely understood. Non-coding RNAs have emerged as master regulators of cell identity and behavior. The majority belongs to the highly heterogeneous class of long non-coding RNAs (lncRNAs). LncRNAs play major roles in cardiac development and disease and in the development of cancer, and some lncRNAs have been implicated in cardiotoxicity. Importantly, lncRNAs are much more cell-type specific than protein-coding genes, making them attractive for targeted intervention. Specifically, targeting lncRNAs in cancer could preserve cardiac function and increase specificity of cancer therapy towards tumor cells. In a collaborative effort within the framework of the EU-CardioRNA COST Action CA17129, we seek to identify heart-specific lncRNAs that are differentially expressed under cardiotoxic TKI-therapy, to characterize their roles in the healthy and stressed heart, and to delineate the mechanisms of their regulatory function. Understanding the lncRNA-mediated molecular mechanisms underlying cardiac side effects of cancer therapy will help guide cancer drug design and provide a rationale for the development of novel and efficient cardioprotective strategies targeting heart-specific lncRNAs.

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